

# WINDPROOF UMBRELLA

## **BACKGROUND OF THE INVENTION**

### **1. Field of the Invention**

5        The present invention relates to windproof umbrellas and more particularly to a windproof umbrella having only one canopy and other improved characteristics.

### **2. Description of Related Art**

Conventionally, a windproof umbrella comprises a large lower canopy  
10    having a central opening or a plurality of vent holes equally spaced around the center, and a small upper canopy in covering relation to the central opening or the vent holes for providing air escape during high winds so as to prevent inversion of the umbrella. For example, U.S. Pat. No. 4,979,534 disclosed a windproof umbrella which is suitable for preventing the umbrella from being  
15    inverted. However, the patent suffered a disadvantage. In detail, a user typically places the handle of the windproof umbrella on top for storage when the user enters a room or any other shelter in a rainy day. As such when stored, rain water carried on the umbrella may enter and accumulated within the upper hub via an outer edge of the lower canopy, gaps between the lower and upper  
20    canopies, and inside of the upper canopy. As such, the accumulated rain water may inadvertently spread over the whole body of the user when the user presses the tab to open and to re-use the umbrella. This may embarrass the user. Further, this is undesired.

A windproof umbrella having only one canopy has been proposed to  
25    overcome the above drawback as illustrated in FIGS. 8 and 9. The umbrella comprises a canopy A, a shank B, a hub B1 on the top of the shank B, a ring B2 slidable along the shank B, an intermediate tab B3 on the shank B for locking

the ring B2 in an open position of the umbrella, a spring B4 between the ring B2 and the hub B1, and a plurality of ribs C and stretchers D for supporting the stretched canopy A. The umbrella will invert from its normal operable position, as shown in FIG. 8, to an upwardly bowed position, as shown in FIG. 9 in response to high winds. As shown, the spring B4 is compressed for limiting the upward inversion of the umbrella to an allowable degree. For returning the umbrella to its normal position, a user has to hold an upper enlargement B5 with one hand, slide the ring B2 downward with the other hand, and press the tab B3 to receive in the shank B. Typically, for folding the umbrella a user has to grip the enlargement B5 in the armpit or between legs prior to pressing the tab B3 with one hand and sliding the ring B2 downward with the other hand. This is difficult task for a woman or child to achieve. Thus, the need for improvement still exists.

## 15 **SUMMARY OF THE INVENTION**

It is an object of the present invention to provide a windproof umbrella adapted to easily return to its normal position after high winds causing the inversion of the umbrella has weakened.

It is another object of the present invention to provide an improved frame of a windproof umbrella in which a plurality of ropes are adapted to cause ribs and canopy to be easily pull to their normal positions after high winds causing the inversion of the umbrella has weakened.

The above and other objects, features and advantages of the present invention will become apparent from the following detailed description taken with the accompanying drawings.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 depicts a preferred embodiment of windproof umbrella according to the invention viewed from an underside;

FIG. 2 is a side view of the umbrella;

5        FIG. 3 is a view similar to FIG. 2 illustrating the inverted frame of the umbrella;

FIGS. 4 and 5 are views similar to FIG. 2 illustrating operations of returning the umbrella to its normal position after the umbrella has been inverted by high winds;

10        FIGS. 6A and 6B are perspective views of the assembled cap and a second intermediate ring on the shank and the cap and the second intermediate ring to be assembled respectively;

FIG. 7A is a perspective view of a rope connector with a rib and a rope fastened therein;

15        FIG. 7B is an exploded view showing the rope connector to be assembled with the rope;

FIG. 8 depicts a conventional windproof umbrella viewed from an underside; and

20        FIG. 9 is a side view illustrating the inverted frame of the umbrella of FIG. 8 by high winds.

## **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

Referring to FIGS. 1 to 7B, there is shown a windproof umbrella constructed in accordance with the invention. The umbrella comprises a shank 10, a canopy 20, a lower ring 11 slidable along the shank 10, a first intermediate ring 13 slidable along the shank 10, a second intermediate ring 14 slidable along the shank 10, the second intermediate ring 14 being higher than the first

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intermediate ring 13, a hub 15 on the top of the shank 10, a spring 12 compressed between the lower ring 11 and the first intermediate ring 13, a plurality of ribs 16 pivotably extended outwardly from the hub 15, a plurality of first connectors 160 each at an intermediate position of the rib 16, a plurality of stretchers 17 pivotably coupled between the first intermediate ring 13 and the first connectors 160, a plurality of second connectors 180 each at a predetermined position of the stretcher 17, a plurality of reinforcing struts 18 pivotably coupled between the lower ring 11 and the stretchers 17, a plurality of rope connectors 40 adjacent the open ends of the ribs 16, and a plurality of ropes 30 formed of a slightly extendable plastic material, the ropes 30 being coupled between the second intermediate ring 14 and the rope connectors 40. For producing a lightweight frame and preventing coupling portions of the components from being easily rusted, preferably the ribs 16 and the stretchers 17 are made of FRP (fiber glass reinforced plastics). Preferably, the rib 16 is implemented as a cylindrical rod and the stretcher 17 is implemented as two parallel, integrally or individually formed cylindrical rods each having a diameter smaller than that of the rib 16. Preferably, each of the first connector 160 and the second connector 180 is formed by injection molding and has a reliable flexibility. Preferably, the strut 18 is formed of steel and is shaped by bending. Preferably, the second connector 180 is formed of FRP and is a member having two parallel channels for permitting the stretchers 17 to pass. An intermediate pivot (not shown) is formed in the second connector 180 for pivotably coupling to an upper hook end (not shown) of the strut 18.

The improvements of the invention are detailed below. The ropes 30 are adapted to tighten the open ends of the ribs 16 for pulling the canopy 20 stretched over the ribs 16 inwardly for preventing the umbrella from being easily inverted in a normal position. Even in a case of the umbrella inverted by high

winds, air can exit upwardly around the edge of the canopy 20 (see FIG. 3). Also, the umbrella is adapted to easily return to its normal position (see FIG. 5) by only pulling the lower ring 11 down slightly with an aid of the plurality of ropes 30 without needing much of force for the user, after high winds causing the inversion of the umbrella has weakened (see FIG. 4).

Referring to FIGS. 7A and 7B specifically, an open end 31 of the rope 30 is substantially, horizontally coupled to the rope connector 40 on the rib 16 adjacent the open end of the rib 16. The rope connector 40 comprises an upper channel 41 with the rib 16 passed through and a lower groove 42 with the open end 31 of the rope 30 fastened thereat. Referring to FIGS. 6A and 6B specifically, the other end 32 of the rope 30 is also substantially, horizontally coupled to the second intermediate ring 14 on the shank 10 in which the other end 32 is knotted prior to fastening in one of a plurality of peripheral notches 142 equally spaced around the second intermediate ring 14 by snapping a plurality of latched legs of a cap 144 onto a body 140 of the second intermediate ring 14 for covering. This assembly is quick and simple. Further, due to the above-mentioned construction for umbrella 30 will pull the canopy 20, the ribs 16, and the stretchers 17 inwardly for preventing the umbrella from being easily inverted in a normal position (see FIGS. 3, 4 and 5). Even in a case of the umbrella inverted by high winds, air can exit upwardly around the edge of the canopy 20. Also, the umbrella is adapted to easily return to its normal position by readily pulling the lower ring 11 down with an aid of the plurality of ropes 30 slightly after high winds causing the inversion of the umbrella has weakened.

While the invention herein disclosed has been described by means of specific embodiments, numerous modifications and variations could be made thereto by those skilled in the art without departing from the scope and spirit of

the invention set forth in the claims.